"If war were declared to-morrow, what would we do for aircraft?"

AVIATION

MARCH 26, 1923 Issued Weekly PRICE 10 CENTS

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VOLUME XIV

Number 13

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MARCH 26, 1923

AVIATION

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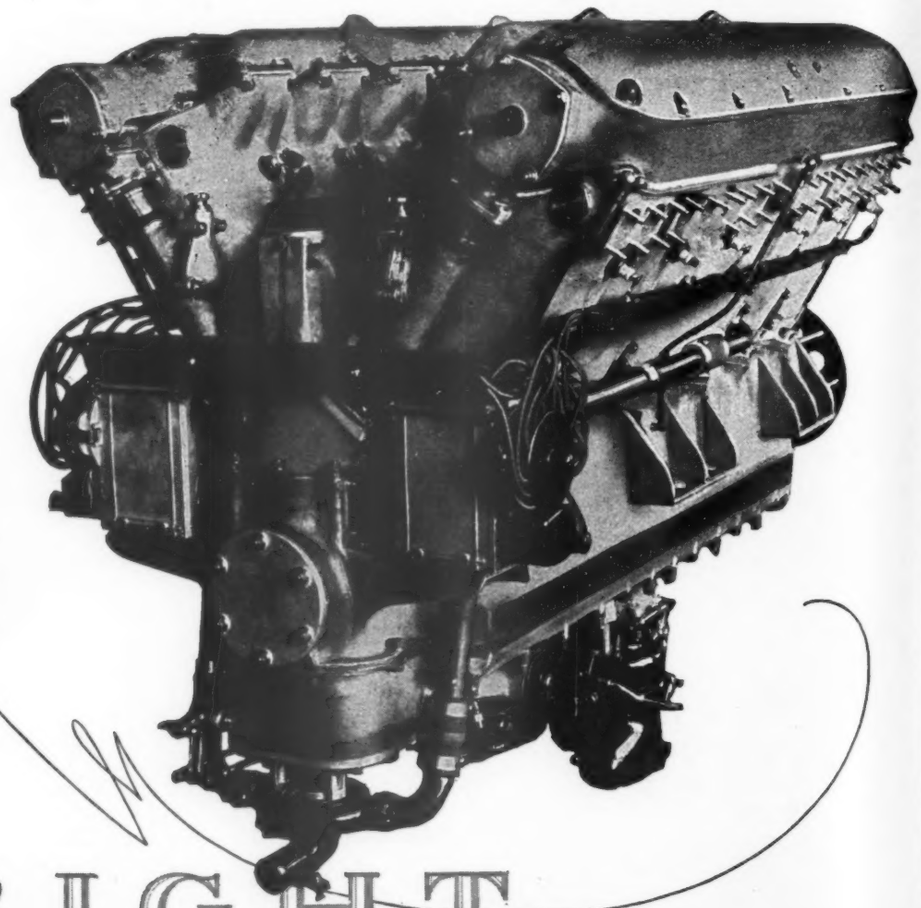

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Air Protection

LONDON buildings, including dwellings and shelters, must be equipped to protect the inhabitants against future aerial warfare, says a report just issued by a semi-official organization, the British Fire Prevention Committee. The committee recommends that as new structures are built and old ones reconstructed, special efforts should be made to make them safe against air bombs. It adds:

"It will be conceded, no doubt, that in future it is probable that instead of any formal declaration of war, the first a country will know of the commencement of hostilities will be a shower of bombs on its capital or some large city."

This opinion, coming as it does just at the time when the subject of the bombing of cities has been under discussion at the Hague is of great interest. It brings to the notice of the world that bombing of unprotected cities is going to be one of the operations most difficult to prevent in future wars.

The uncertain element is not the fact that such warfare is regarded as inhumane and contrary to international agreements, but that some smaller or weaker nation may find itself so hard pressed and without other available means of effectual attack that it will justify its action on the grounds that self preservation is the first law of nature.

A similar situation exists in gas warfare. Solemn agreements have been entered into regarding the use to which gas may be put in warfare, but military and naval authorities seem to feel that they must be prepared in case such restrictions should be violated. In the same way the best aviation strategists are not satisfied with the international agreements, but prepare for eventualities.

Popular abhorrence of all forms of new death dealing instruments of war is natural. It was just as prevalent when powder was first used. Hand to hand combat was then regarded as the only chivalrous form of combat. When gunpowder separated the combatants and did not give the attacked what then seemed a fair opportunity of personal defense, popular opinion strongly protested against the new means of destruction. At a later time, when cities were shelled by artillery or naval guns, the same spirit of horror was in evidence. In the last war gas warfare and aircraft bombing were the new elements introduced.

Just what the difference between bombing a city by Big Berthas and by aircraft is, would be hard to explain, except on the grounds of novelty. If bombing of unfortified cities is to be prohibited, shelling of them by artillery should be similarly suppressed. In other words, aircraft should not be regarded as more inhuman than the older arms just because it is more effective.

Laws are only expressions of the highest conceptions of peoples. Their enforcement is the problem that brings out the ever present danger of violations. While no one can believe that inhumane warfare will ever be countenanced by the United States, it must always be realized that we must be ready to protect our citizens from attacks of outlaws, whether individuals or nations.

December 17, 1903

THE twentieth anniversary of the first mechanical flight, accomplished by Wilbur and Orville Wright on Dec. 17, 1903, occurs this year. As yet no adequate plan has been proposed fittingly to celebrate this anniversary which in centuries to come will be considered as one of the cornerstones of modern civilization.

It would be eminently fitting that an exposition of some kind be held at which the earliest developments in aeronautics would be shown to the public. As a counterpart, the governmental air services might arrange a flying meet in which the latest types of aircraft would be flown, not for prizes, but in honor of the two great pioneers.

International congresses have been held in Europe at which representatives of the countries interested in aeronautics have met to discuss the outstanding aeronautical problems of the day. What better form could such a celebration take than an International Air Congress to which representatives from all parts of the world would gather to show their appreciation of the great work done by the famous brothers from Dayton.

The Cost of War Aviation

THE figures on the cost of our war-time aeronautical effort which Maj. Gen. Mason M. Patrick, Chief of Air Service, just made public, and which are reproduced in this issue, show that the money actually spent by the Army Air Service in the war with Germany was approximately $382,000,000.

It would be good if this fact received the widest possible publicity so that the public may be disabused of the fairy tale that our war-time aircraft expenditures amounted to "a billion and a half dollars." This notion has received such wide credence that a determined effort should be made to explode it, now that the facts of the case have been established.

56 Cents for Aviation

IN computing the amount of money paid by each worker in the United States it is found that out of every one hundred dollars secured by the government the sum of eleven dollars and eighty cents goes to the War Department, and of this fifty-six cents is spent on the Air Service.

One half of one per cent for national defense by means of air power does not appear to be a heavy burden on the American taxpayer.

"If war were declared to-morrow what would we do for aircraft?"

Total Cost of War Aviation—$382,111,063.50

General Patrick Issues Statement Showing War Cost Was Only One Quarter of Appropriations

In April, 1921, AVIATION published for the first time the official figures of the Cost of American Military Aeronautics in the war with Germany. The figure at that time available was $598,090,781 without giving any consideration to the valuation of the supplies and equipment on hand which represents an investment by the government which is being utilized now and is not properly to be charged to the war. Deducting a fair valuation of this property, the actual net cost of our wartime military air effort is shown to be $382,111,063.50.

General Patrick gives in the February issue of *Current History* a very clear statement of these wartime costs. He comments on the appropriations as follows:

"Congress moved by the demand of the people for a vigorous aircraft program, appropriated vast sums of money, and when the war was ended, and it was known that we had actually sent to France less than 2,000 airplanes, and these the slower two-seater, observation planes, and not a single one of the faster combat, fighting, so-called pursuit planes, there was great indignation and a violent outcry that, for a billion or more dollars spent, we had nothing to show in the way of accomplishment.

"All those who had to do with the aircraft program came in for scathing criticism, and then followed the searching investigation conducted by Mr. Hughes, which went thoroughly into every phase of the matter.

No Misappropriations

"Probably to the surprise of many, the results of this inquiry were almost nil. There was no evidence of any misappropriation of money. Except in a very few cases, none of those who were responsible for the effort to " put the United States into the air" were subjected to severe censure.

The figures which follow have been taken from the books of the Treasury and from the records of the Army Air Service.

"To start with, it is known that Congress appropriated for army aeronautics from April 7, 1917, to June 30, 1919, the total sum of $1,691,854,758. This figure often quoted, represents in the minds of many people the *expenditure* which they think was actually made.

"It should first be pointed out, however, that at the beginning of the war, what there was of an Air Service in the Army was part of the Signal Corps. A portion of the sum given above, or, to be exact, $42,759,552.71, was expended for Signal Corps activities entirely apart from aeronautics and not properly chargeable thereto.

Some of the Deductions

"Other considerable deductions must be made, as shown by the items listed below:

When the war ended there was still a large balance available, and by Congressional action $490,515,060.14 of this balance reverted to the Treasury.

"Of the aircraft materials originally purchased by the United States for its own use, some were sold to the Allies, and the amounts paid, or to be paid therefor, aggregated $91,934,187.71, which likewise will revert to the Treasury.

"After the war, materials of all kinds, which had cost $105,827,698.67, were transferred by the War Department to other branches of the Government which could use them in their peace-time activities.

"From the sale of surplus material there has already been realized the sum of $26,188,057.64; material still to be sold will bring into the Treasury, it is estimated, about $408,433.74, or a total of $28,596,491.38.

"Refunds in the sum of $2,945,785.06 on account of sales of supplies and war credit advances to contractors during the life of their war contracts have been collected and credited back to the Treasury Department.

"Land and buildings also purchased from the appropriation for aeronautics, but now no longer needed by the Air Service, are being placed upon the market, and their sale value is approximately $7,718,944.

"From this same appropriation the sum of $21,500,000 was advanced to the Spruce Production Corporation. Every dollar of this is being returned to the Treasury, as the affairs of the corporation are being liquidated.

Sums Due from Contractors

"It is claimed by the United States that the sum of not less than $40,000,000 is due from contractors who were overpaid, and steps to recover are being taken. This needs a word of explanation. No charges of graft or fraud are made in explanation of these overpayments. When the war suddenly came to a close, there were many contractors engaged in manufacturing aeronautical material. The work was stopped at once. There was an earnest desire to have these contractors turn their energies to peace-time production. This they could not do until some kind of a settlement was made with them by the United States. Many of the contracts were very much involved. It was evident that much time would be needed to effect absolutely accurate settlements. All the contracts contained a provision requiring the contractor to preserve his records for some years, and giving the United States access to them. It has taken over a year to make an audit of these contracts. Rather than suffer this long delay, during which these concerns would have had to remain idle while the audit was in progress, a hasty settlement was made with them and they actually did start promptly to manufacture other than war materials. It was plainly understood by the United States that these settlements were not final. As soon as possible the audits were undertaken, and the concrete result is as stated above, the overpayments aggregating some $40,000,000. Three of the contractors have already returned to the United States the amounts overpaid them.

"During the period from June 30, 1919, to June 30, 1921, unexpended balances in the sum of $290,479,474.98 reverted to the surplus fund of the Treasury Department by limitation of law.

Tabulated Expenditures

"Reduced to tabular form, the cost of the wartime aeronautic effort of the United States resolves itself as follows:

Total amount appropriated by Congress for war purposes		$1,691,854,758.00
Expenditures by Signal Corps proper		42,759,552.71
		$1,649,095,205.29
Revocation by act of Congress		490,515,060.14
		$1,158,580,145.15
Actual sales value to foreign governments		91,934,187.71
		$1,066,645,957.44
Cost value of supplies and equipment transferred to other departments and bureaus		105,827,698.67
		$ 960,818,258.77
Sales value of surplus supplies equipment sold in United States		28,596,491.38
		$ 932,221,767.39

"If war were declared to-morrow what would we do for aircraft?"

Refunds account sale supplies and war credit advances to contractors		2,945,785.06
	$	929,275,982.33
Estimated sales value of stations abandoned		7,718,944.00
	$	921,557,038.33
Refund account of advance to Spruce Production Corporation		21,500,000.00
	$	900,057,038.33
Estimated recovery account overpayment war contracts		40,000,000.00
	$	860,057,038.33
Unexpended balance expiring by limitations of law		290,479,474.98
	$	569,577,563.35

"It will be noted that, with the exception of two items, all the figures in the above table are taken from the records and are exact. The two "estimated" items are believed to be close approximations to the amounts which will be realized. Accepting them as they stand, the total net expenditure for aeronautics is therefore $569,577,563.35, a large sum, but only about one-third of the total amount appropriated by Congress, the "more than a billion and a half dollars" which many of our people believe was spent for aircraft and engines, with nothing to show for it.

"It may be worth while to analyze this expenditure briefly. Every dollar of the total of $569,577,563.35 can be accounted for. Though it was all spent for aeronautics, in the effort to place a well-equipped, efficient air force with our army in France, it is a fact that a very large part of this sum was necessarily expended for other things than aircraft and engines.

"With it were purchased and leased flying fields in many parts of the United States, and the necessary buildings were placed thereon. Clothing for aviators, airplane instruments and accessories, motor vehicles, gasoline and lubricants, observation balloons and gas with which to inflate them, training planes and engines, and innumerable other items accounted for still more of these millions.

The Merit of the Liberty Engine

The perfection of the Liberty engine was the greatest aviation achievement of the United States during the war. All told 17,368 of these engines were produced by Dec. 31, 1918. Of this total, 4,511 engines, in addition to those installed in the planes shipped to France, were sent to the Army Air Service over there. The Navy was given 3,742 and some went to the English, French and Italians, all of whom urgently desired to obtain large numbers of them after their excellence had been proved.

"Our own Air Service has continued to use these Liberty engines since the war, and none has yet been developed which is their superior. On July 1, 1922, the Air Service had on hand 11,167 of these engines, and will continue to use them for some years to come. The known present-day cost of an engine which may be classed with the Liberty, is $9,500 each. Valuing the Liberty engines at $7,500 each, the number on hand represents $83,752,500.

"The estimated value of other property still in the hands of the Air Service, such as the flying fields and depots now occupied, the buildings thereon after allowing for deterioration, instruments, armament and accessories for aircraft of the more than 150,000 items carried by the Supply Division of the Air Service, aggregate $103,693,949.85. Adding the values of these assets, we must deduct $187,446,449.85."

As will be seen this leaves the net cost of our wartime aviation effort at $382,111,063.50.

It is interesting to note how slight has been the change in the figures presented by General Patrick as compared with the figures compiled by AVIATION two years ago. His figure is about thirty million dollars less than the figures given by AVIATION. This reduction is due to the further transfer to other departments of material on hand, further sales of surplus supplies and refunds received.

Of the money spent it was shown that only 14 per cent of the total expenditure was for airplanes in the United States. Including those bought abroad only 19 per cent was spent for aircraft. This of course does not include the engine purchases which numbered 41,953. As will be seen from General Patrick's statement, one quarter of these are still on hand and serviceable.

At a time when aviation is being retarded by the misconception in the public mind that our wartime aircraft expenditures amounted to "a billion and a half dollars," it is reassuring to learn from official figures that the total expenditure was $569,577,563.35 from which should be deducted $187,446,449.85 leaving $382,111,063.05 as the final figure.

Entries, National Balloon Race

Commercial organizations and aero clubs of Detroit, Indianapolis, Milwaukee and San Antonio have all filed claims to the free balloon competition scheduled for early June with the contest committee of the National Aeronautic Association. According to B. Russell Shaw, chairman of the committee, there never has been such intense rivalry for this elimination event so early in the year, nor so strong backing by four large cities of their local claims. Milwaukee, where thirteen contenders started in last year's race that was won by Maj. Oscar Westover, A. S., is doing his utmost to cinch this year's event. The Aero Club of Indianapolis has started an active campaign, and in Detroit and San Antonio enthusiasm is running high.

Three mystery entries for the contest are causing balloon sharps to speculate on identity of the probable pilots; two new balloons will be entered by the Aircraft Development Corp. of Detroit, and St. Louis will enter a new pilot.

The preliminary list assures the appearance of Ralph H. Upson, of Detroit, winner of the James Gordon Bennett trophy in 1913; Capt. H. E. Honeywell, of St. Louis, who was second in last year's race; Capt. G. L. Brumbaugh, of Indianapolis; Maj. Oscar Westover, U. S. Army; Lieut. Comdr. J. P. Norfleet, U. S. Navy; Capt. John Barry, of St. Louis; Roy Donaldson, of Springfield, Ill.; Ward T. Van Orman, of Akron, O., and J. S. McKibben, of St. Louis, all contenders in former races.

There will be a purse of $3,000 for the prize winners, from whom will be selected three contestants and three alternates for entry in the International balloon race for the James Gordon Bennett trophy to be held in Belgium, Sept. 23. The American record for free balloon flight has stood since 1910 when Allan Hawley of New York city covered 1,172 miles. The world's mark, made by Berliner of Germany in 1914 is 1,897 miles.

An Interesting Airplane

Variable camber monoplane designed and built by C. F. Rochevelle, Av. Mach. Mate, 1st Cl. and tested by Lieut. F. C. Fake, U.S.N., at San Diego

"If war were declared to-morrow what would we do for aircraft?"

The New British Airway Subsidy Scheme

One Company to Operate All Airways With a Guaranteed Ten Year Subsidy

A brief outline of the new civil air transport subsidy scheme which the British air ministry made public on Feb. 23, last, was published in the last issue of AVIATION. *Owing to the courtesy of the British air ministry we are able to publish below the report of the Civil Air Transport Subsidies Committee which was charged Jan. 2, 1923, by Lt. Col. Sir Samuel Hoare, Secretary of State for Air, "to consider the present working of the scheme of cross-Channel subsidies and to advise on the best method of subsidizing air transport in the future." In view of the general reluctance Britons as well as Americans profess toward subsidized services, the recommendations contained in this report will be read with considerable interest. EDITOR.*

The Committee held fifteen meetings and took evidence from representatives of the Air Ministry, operating companies, aircraft constructing companies and large commercial organizations, and from others.

The report is divided into two parts; in the first the Committee reviews the past and present schemes of subsidy, and in the second it presents its proposals for the future. In this regard it is stated that the question of airship services or the question of an airplane service to India have not been dealt with as both these subjects have already received independent consideration.

Subsidy Schemes which Failed

In the first part of the report the Committee states that there have been, including the subsidy now in operation, three different schemes; the first known as the "temporary" scheme was introduced in March 1921, in order to revive British air transport services to the Continent, the last of which had come to an end in the previous month owing to the inability of the British companies to compete against the heavily subsidized French companies which had reduced fares to an uneconomic rate. This scheme was replaced on April 1, 1922, by the second scheme, which was known as the "permanent" scheme, and was continued until Sept. 30 of the same year.

The present scheme, known as the "revised" scheme came into operation on Oct. 1 last and according to the agreements with the operating companies, will continue until March 31, 1924.

The Air Ministry was authorized to spend £600,000 during the period March, 1921—March, 1924, subject to the annual liability not exceeding £200,000. It is estimated that by the end of the period £511,940 will be spent.

The main details of each of these schemes have already been published, but the Committee now presents, so far as the accounts permit, an analysis of the financial costs of the different schemes. In the temporary scheme two firms were subsidized to operate services between London and Paris—Handley Page Transport Ltd., and S. Instone & Co., Ltd. Between March, 1921, and the end of March, 1922, £85,671 was paid to these companies. During the period the total number of passengers carried on 1,072 single flights was 5,804. The subsidy was equivalent to 7 sh. 1p. per machine mile and £14.15.0 per passenger. The net revenue of the companies was £29,424 and the total expenditure £120,493. An analysis of the expenditure and costs shows that the average cost of operating was 10 sh. per machine mile and £20.15.3 per passenger. Subdivided, these figures show that the flying charges amounted to 2sh. per machine mile and £4.2.6 per passenger, while the non-flying and overhead charges were 8sh. per machine mile and £16.12.9 per passenger.

In the "permanent" scheme the two companies previously mentioned together with Daimler Hire Ltd. were approved to operate services between London and Paris, while the Instone Air Line Ltd., also received authorization to operate a London-Brussels service. During the period this scheme was in operation 1,588 single flights took place on the London-Paris services, the number of passengers carried being 5,860. Owing to the losses sustained by the companies as the result of the anticipated traffic not materializing, additional payments were made as compensation to the companies. The estimated amount for subsidies and compensation being £66,169. The whole of the financial information regarding this period is not available, but the average amount paid by way of subsidies per machine mile and per passenger was reduced to 3sh. 8d. and £11.5.10 respectively as compared with the figures under the "temporary" scheme.

The maximum expenditure in connection with the "revised" scheme of subsidies for the eighteen months to March 31, 1924, is estimated at £304,000.

The Committee states that the first two schemes aimed definitely at maintaining competition between British air transport companies, while the revised scheme on the other hand abolished competiton except of an international character. The Committee is of the opinion that the revised scheme suffers from the same defect as the temporary scheme in that it secures to each firm an assured income and offers no encouragement whatever to an operating company to fly a single journey or mile beyond the number settled in the agreement. The permanent scheme, on the other hand, was successful in securing a large increase in the proportion of traffic carried by British companies, but the estimated increase of traffic did not materialize to such an extent as to justify competition between the three British companies on the London-Paris service. At the same time this competition brought about the development of new theories connected with what may be called the intensive use of aircraft that should have lasting results in the reduction of overhead costs in relation to the number of miles flown.

The Committee is forced to the conclusion on its examination of the working of the several subsidy schemes that after the expiration of nearly two-thirds of the total period of three years commercial civil aviation has in fact made little progress toward being able to "fly by itself" without financial assistance from the Government, nor is it hopeful that the present revised scheme of subsidies, which terminates on March 31, 1924, will have effected any material change.

The recommendations of the Committee are far reaching. It proposes that on the termination of the present agreements with the British companies operating services on cross-Channel routes, a new company with a capital of £1,000,000 (of which at first £500,000 should be subscribed) should be established to operate air transport services which would be guaranteed subsidies of not less than £1,000,000 over a period of ten years, control to be exercised by the Government through one or two nominated directors.

The Committee states that it has made this proposal because it cannot satisfy itself that "any comparatively small operating company can be in such a position as to expend the necessary capital from its own resources on experiment, research and development," and it also expresses the opinion, for the same reason, that it is "not prepared to recommend that the Government should grant subsidies to any company which is merely an amalgamation of the existing companies."

In presenting its proposals for the future the Committee states that it has been thought necessary to approach the problem afresh from the beginning. The Committee says:

Demand for Civil Air Transport

"We have assured ourselves that there is a very real desire in their own interests on the part of the commercial world,

both manufacturers and merchants, to see efficient air transport services in operation between this country and the Continent even at the cost of considerable subsidies from the Government, nothwithstanding their strong views on the need for national economy. We have for instance had brought to our notice the desire of the Manchester Chamber of Commerce for quicker methods of transporting their samples, mails and light goods abroad, which implies the maintenance of the Manchester-London service and the extension in the length of the services operated."

The importance of operational research is emphasized and the Committee express the view that a large sum of money must be expended on this work during the next few years. It has also been impressed by the statement that the London-Paris and London-Brussels services are too short to be more than commercially experimental and that a company can only be self supporting by the development of new and longer routes. This again involves much financial expenditure.

Effective Spending of Subsidies

The Committee is satisfied "that no effective spending of Government subsidies by the companies can be obtained unless the companies themselves are concerned in the risking and expenditure of their own resources. It is no reflection on the existing companies to say that neither they nor any other company can be expected to find or risk the necessary amounts unless subsidies are provided and their position in every respect secured for a longer period than three years."

The Committee goes on to point out that the amount of the subsidies and compensations paid by the Air Ministry under the temporary and permanent schemes was approximately double the passenger and freight revenue, so that the burden of the financial risk was mainly on the Government, which was, therefore, in effect, competing with itself. "There was not sufficient demand for air traffic to offer the conditions essential to real competition and the result of the permanent scheme was, therefore, to increase the number of British airplanes on the London-Paris route, with consequently increased expenditure on flying costs, insurance and depreciation, and to reduce the number of passengers per machine while the unnecessary cost of separate organization and independent management was maintained. The benefit of competition under these schemes was therfore illusory, and until civil aerial transport has become more nearly self-supporting we do not think competition can be relied on unless at an unnecessary cost to stimulate its development. So far as efficiency of service is concerned adequate incentive should be provided by the direct competition of foreign countries with large Government resources behind them. We do not think, therefore, that in any scheme of subsidies it is necessary at present to ensure competition."

General Outline of the Proposals

The Committee outlines its proposals as follows:—

Subsidies could be given:—

(a) To the existing or other independent operating companies.

(b) To an amalgamation of the existing companies.

or (c) To a new commercial organization established for the purpose.

We have examined each of these proposals in turn, and have decided against recommending the adoption of the first method because we cannot satisfy ourselves that any comparatively small operating company can be in such a position as to expend the necessary capital from its own resources on experiment, research and development. We feel, however, in view of the part that the three existing subsidized companies have taken during these difficult years that their interests should not be overlooked in any proposals for the period subsequent to the termination of the present arrangements on March 31, 1924. For the same reason we are not prepared to recommend that the Government should grant subsidies to any company which is merely an amalgamation of the existing companies.

We have, therefore, been forced to recommend the creation of a new organization as the solution of a difficult problem that is most likely to attain the end we have in view.

In the first place, we desire to make it clear that we do not recommend the creation of a Corporation or Company administered under Government control, but of a commercial organization run entirely on business lines with a privileged position with regard to air transport subsidies, on terms and conditions to be defined later.

We consider that it would be impossible to bring such an organization into existence on the security of subsidies granted only for the short period of three or five years, and that a bolder policy of guaranteeing a total subsidy of a stated amount, spread over a period of ten years should be faced, and in our deliberate opinion, is the only sound policy that is likely to meet with success.

An essential condition, however, to such a proposal is that the company should have large resources of its own so that in the expenditure of capital on operational experiment and on the development of new and extended routes, the Company is primarily risking its own resources.

Organization of the Company

As an indication of the main lines of our proposals, we suggest that:—

(a) The Company should have a capital of £1,000,000 (of which at first £500,000 should be subscribed) with the right to the Government of nominating one or two directors, and the whole of the subscribed capital should have been guaranteed before the Government commenced to subsidize the company.

(b) The profits of the company should be divided as follows:—

(1) In payment of a cumulative dividend of 10 per cent per annum on the ordinary shares of the company.

(2) After the foregoing dividend has been satisfied, the balance of profits in any year to be divided equally between the shareholders and the Government.

(3) When the Government shall have received in dividends £1,000,000 (being the proposed amount of subsidy without interest) the Government interest in the company ceases and the whole profits of the company shall belong to the shareholders.

(c) The Government should guarantee a subsidy (spread over the period of ten years, but not in equal annual instalments) of such an amount as will enable a financial group to raise the share capital, and in our opinion such subsidy will not be less than £1,000,000; conditions must be attached to the payment of the subsidy requiring the company to perform services in connection with the operation and development of commercial air transport.

(d) The Government should not exercise any direct control over the activities of the company, other than by the appointment of directors, except for the purpose of such checking as may be necessary to determine the amount of subsidy payable and except for such control as may from time to time be exercised by the Government through the Civil Aviation Department over all civil flying in the country.

(e) Restrictions as to the routes operated, the types of machines, the number of daily services, the minimum allowance for point to point flights, etc., should be unnecessary, as it would be in the interests of the directors to manage the company to the best commercial advantage at the minimum cost with the best types of machines.

(f) There should be an agreement between the Government and the company that in the event of war or of the imminence of hostilities the Government would have the right to take over all aircraft engines and plant on conditions to be laid down.

(g) The agreement to be terminated if the company goes into liquidation and the Government to have the right of cancellation under stated conditions.

Reorganization of the Curtiss Corporation

Two Companies Created, One for Liquidating Assets, the Other to Continue Manufacturing

A novel reorganization plan has been worked out by a majority group of the stockholders of the Curtiss Aeroplane & Motor Corp. and is now announced to all the stockholders by C. M. Keys, who is the largest stockholder in the Corporation.

The plan involves no new financing and results in the decrease of the present outstanding capitalization. The unique feature of the plan is that it liquidates a substantial part of the present capital by the setting aside of assets which have nothing to do with the manufacturing end of the Corporation, and segregates the manufacturing assets into a new manufacturing company. In effect, this will result in making two new companies out of the present Corporation, one of which will be a purely manufacturing company and the other will be engaged in liquidating the other assets.

Two New Companies

The new manufacturing company will probably be known as the Curtiss Aeroplane & Motor Co., and the company which will hold the assets for liquidation, will probably be known as the Curtiss Assets Co. The new manufacturing company will take over the plant, inventories, contracts, the Curtiss Flying Field, exactly as they stand, and continue the manufacturing exactly as it is now running.

The Curtiss Assets Co. will buy commercial airplanes and motors and spare parts, worth approximately $1,600,000, and also all the American airplane patents from which royalties are now received. The Assets Company will issue $2,731,500 Certificates of Beneficial Interest, which will ultimately become the property of the present preferred stockholders. As assets are liquidated, either by sale or receipt of royalties, the funds will be distributed directly to the preferred stockholders. A contract will be made between the two new companies under which the manufacturing company will meet all of the expenses of the Assets Company, just as the present Corporation meets all of the expenses at the present time.

The new manufacturing company will have an outstanding capital of $2,731,500, 7 per cent preferred, cumulative as to 5 per cent, but non-cumulative as to the remaining 2 per cent. The stock will also participate equally, share for share, on any dividends paid on the stock in the future until $42.00 a share has been paid in this way. This provision is to take care of the present cumulative dividends on the old preferred stock.

In the reorganization, holders of the present preferred stock will receive $50.00 preferred stock of the new manufacturing company and $50.00 in Certificates of Beneficial Interest in the Assets Company. The present common stockholders will receive share for share the new common stock of the manufacturing company.

Statement by C. M. Keys

C. M. Keys, President of the company has sent to the stockholders the following statement regarding the affairs of the company.

Your Corporation now has the following capital stock outstanding:

Preferred Stock $5,463,100 (par value)—Common Stock 218,016 no par value shares. It likewise has liabilities secured by mortgages on the Company's property: $1,776,701.16.

The Corporation has never declared a dividend on the common stock, and no dividends on the preferred stocks have been paid since January, 1920.

The Corporation has earned no surplus net profits during 1920, 1921 and 1922 and, therefore, it has not been able to set aside sums either for the payment of preferred dividends, or for the preferred stock sinking fund, because dividends and sinking fund payments may be paid only to the extent that there are surplus net profits available for that purpose, as provided by the certificate of incorporation and the laws of New York.

The Corporation has among its assets certain airplanes and motors acquired after the Armistice from the War Department, together with the parts therefor. It also has a commercial inventory represented by planes, motors and parts manufactured by the Corporation for the purpose of sale for commercial use. In accordance with Schedule A hereto annexed these items as of Dec. 31, 1922 at cost price to the Corporation, less depreciation, total $1,659,941.54.

The Corporation likewise owns certain domestic airplane patents which in 1917 were subjected, upon the insistence of the Government, to the provisions of a cross license agreement which is administered by the Manufacturers' Aircraft Association. Under this agreement the Corporation was to receive a maximum of $2,000,000. It has already received $434,580. Commencing with May 1, 1923, and thereafter until 1933, the Corporation will receive from the Manufacturers' Aircraft Association royalties at the rate of $175 for every airplane manufactured in the United States until the balance of said $2,000,000 maximum payment has been received.

At the present time sales are being made of the government and commercial inventories from time to time and moneys are received from the Manufacturers' Aircraft Association. The directors feel that these moneys, although they are properly now being used in connection with the Corporation's manufacturing enterprises, are nevertheless in the nature of a realization or liquidation of capital assets, and in view of the fact that preferred dividends have not been earned or paid for the last three years, they should be set aside for the benefit of the preferred stockholders in such a way that whatever is realized from these assets should be turned over to the preferred stockholders.

Business of the Corporation

The manufacturing business has done as well as its competitors, but in view of the tremendous surpluses of government owned aircraft, the demand for new production has not been great enough to support any considerable industry, and the prices received, being almost entirely on a competitive basis, have not been such as to permit the realization of any considerable profit.

The business of the Corporation is almost wholly manufacturing for the Army and the Navy. This business does not and will not justify the present capitalization of the Corporation. To protect the investment of the preferred stockholders, to enable the Corporation to refund its obligations when due, and assure it of needed working capital, and to afford to the Corporation an opportunity to become a strong manufacturing enterprise by segregating the activities which have nothing to do with its manufacturing functions, the plan of reorganization has been informally approved by the owners or representatives of owners of a majority in interest of both the preferred and common stock at whose instance the plan is presented to the stockholders.

The operating results of the company for the year 1922 showed a profit of $16,169.94, compared with the profit of $101,207.17 for 1921.

Orders on the books at the close of the year amounted to $3,752,009.02, as compared with $1,763,224.55, in 1921.

The policy of concentrating the efforts of the corporation on engineering, which was inaugurated when the present management took control of the corporation in 1920, culminated during the year in the establishment of a new method of cooling motors and in the winning of the Pulitzer Race, in which Curtiss ships finished first, second, third and fourth, all four making world's records for a closed course.

"If war were declared to-morrow what would we do for aircraft?"

This success is directly responsible for the re-entrance of the corporation into motor building on a substantial scale. This, in turn, has resulted in the re-opening of a part of the Buffalo factory so that this unit, instead of being a burden on the corporation's finances, should become a profitable part of the corporation's plant. It is the policy of the management to continue throughout 1923, to carry on a substantial engineering program for the development and invention of improved types of airplanes, motors, and appliances, as only by such a policy can the permanent place of your corporation in the aeronautical art be assured. The management believes, however, that it will be able to maintain on its books a larger volume of production business than has been the case in the past few years, and that there is fair assurance of profitable operations throughout the year. The management has given much thought to the working out of a plan whereby the capitalization of the company can be reduced to an extent that will make it possible to make some return to preferred stockholders on their investment, and will also make it possible for the company to establish its credit and its financial reputation on a firm basis, and so be able to meet its capital liabilities as they mature, and take care of its working capital requirements. The working capital of the company is sufficient to take care of its immediate needs, with the present volume of business, but in case of any substantial growth in business from the present level, additional working capital will be required. It is the aim of the management to take care of such requirements in advance, rather than to find itself in a weak position when it comes to bidding on production contracts.

Navy-Wright Plane Makes 200 m.p.h.

The second Navy-Wright plane of the type entered in the last Pulitzer race at Selfridge Field as the Navy "Mystery," was recently completed and successfully flown at Mitchel Field by Lieutenant Sanderson, U.S.M.C. In a series of tests this ship, which is fitted with the Wright T2 550 hp. engine, averaged better than 200 m.p.h. This showing was very gratifying to officials of the Wright Aeronautical Corp. and Navy officers who witnessed the tests, as the actual speed of this type could not be determined in the Pulitzer race, where the Navy-Wright ship had a forced landing due to overheating oil. This overheating was due to the fact that in the two test flights made prior to the actual entry in the Pulitzer race the cowling had not been used on the engine. When this cowling was used in the race, the oil overheated owing to inadequate radiation.

Just how well this plane handled from the flier's viewpoint is told by Lieutenant Sanderson, who flew the first ship at Detroit and whose opinion therefore as to what the present N-W can do is of the greatest value.

Lieutenant Sanderson said:

"Six or seven separate flights were made, and by chance the wind at each time was in such a direction that it was necessary to taxi twice across the full width of Mitchel Field. The ground was frozen hard with snow at times, there was ice on the puddles, and all the ruts and hillets were as hard as rock. This, of course, was a severe strain on the landing gear of the original design, but everything fuctioned well on this landing gear except when the plane went through the ice on the puddle and the ice caught in the shock absorber fairing; also, another time when one of the shock absorber cords let go. Needless to say, this long taxiing from an exceedingly hard field was a severe strain on the landing gear. A tail-skid, with a knife edge, was used, but no indication of the desire to ground-lap was noticed, even though the ground was frozen so hard that the knife edge on the tail-skid hardly made a mark on the ground.

"We tried to give a thorough test of the power plant, the same size and design of oil radiator was used as on NW1. It was found that even in cold weather the oil temperature hovered from 160 to 165 deg. F. If the flying had been done in warmer weather undoubtedly the oil temperature would have risen beyond the safe limit. It is of interest to note that not even a single spark plug was changed during this long grilling test, although the compression on the engine was 6½ : 1. No particular trouble was found in starting the engine, although it was considered desirable to heat the oil and water."

It was interesting to see how Lieutenant Sanderson, after his preliminary flight, began to get increased economy and better performance through becoming sufficiently familiar with the plane to have time to carefully adjust his control mixture. The fuel consumption of this large engine, as ascertained in these flights, was remarkably low, as was also the oil consumption which ran only a little over one gallon per hour.

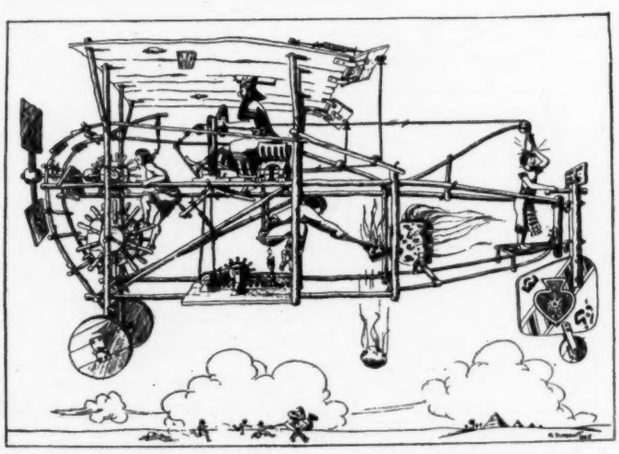
Continuing, Lieutenant Sanderson asserted:

"From a flying standpoint, it was interesting to note how the plane seemed to float through the air at low throttle. Throttling down to 1700 r.p.m., the plane was still making 186½ m.p.h., and a further throttling to 1500 r.p.m. gave 148 m.p.h. over the measured course. A little trouble was experienced with one of the fins of one of the Lamblin radiators leaking, but fortunately Mr. Given, in charge of the Wright working party, had had experience abroad with servicing hundreds of Lamblin radiators in fighting service, so it was no difficult task for him to cut out the leaking fin and solder up the connection. This was the only trouble experienced with the Lamblin radiators, although, as a precaution, a small quantity of alcohol was inserted in them each night. The weather conditions were so severe during these flight tests that very little flying was being done from the field."

According to present plans of the Navy Department the Navy-Wright will be converted into a seaplane by fitting it with floats with a view to entering it in the Schneider Cup race which will be held at the Isle of Wight, England, Sept. 28, 1923.

French Civil Aircraft

According to *L'Auto*, the French civil air fleet is at present composed as follows: 271 machines in use on approved air lines, 178 machines in use on other lines, 198 machines in use at flying schools and 29 private machines used for touring, etc. The total is 676 civilian airplanes.



Courtesy *Flight*

Tut-ankh-Amen's battleplane—drawn from plans found during the recent excavations. Their authenticity is not vouchsafed

"If war were declared to-morrow what would we do for aircraft?"

Industrial Mobilization and Aviation

Final Report of the Retiring Assistant Secretary of War, J. Mayhew Wainwright

The following are extracts from the final report of the retiring Assistant Secretary of War, J. Mayhew Wainwright, dealing particularly with the problem of industrial mobilization. His remarks with regard to our fast slipping air power are of timely interest.—EDITOR

The problem is to insure, so far as foresight may provide, that our industrial establishments and factories may be prepared, upon the outbreak of war, to turn, as rapidly as possible, from their peace time tasks to the production and creation of those things that shall have the primary call and preference upon their facilities for production. This call and the load so placed should be, however, so nicely adjusted that the essential needs of the people shall be disturbed only so far as is necessary. Much of these requirements can be met without great dislocation of business or industry—that is to say, the clothing, subsistence and other elements of supply which do not differ essentially from the peace-time requirements of the people generally.

Munitions and Aircraft

But with munitions and aircraft and related supplies—that is to say, with those elements of supply furnished principally by the Ordnance and the Air Service, it is another matter—those being all of a special nature and requiring either the diversion, transformation or the great extension of existing or the creation of new facilities. Here, as well as elsewhere, difficult and complex problems arise. The effort must be to insure the acceleration of production to the utmost extent conformable with the size and rate of mobilization of the man-power. Every factory, every industrial establishment must be induced to get into its stride of maximum production at the earliest possible moment, thus, and thus alone, can the new levies be expedited through the training camps and forwarded to the theatre of operations—equipped to meet the needs of the military situation, and thus alone can the necessary flow of munitions and material be maintained to the commanders in the field.

Roughly, there are three great elements of supply:

1. Those things which the ordinary or current productive capacity of the country can be relied upon to furnish.
2. Technical supplies, such as munitions and aircraft.
3. The strategic materials—namely those not produced in sufficient quantity within the continental limits of the United States, such as nitrate, metal alloy, tin, rubber, platinum, tungsten and the like.

The end to be sought must be to insure that the production curve in each or as many as possible of the essential elements of supply shall meet the curve of the induction of man-power into service at the earliest point of time.

It may be interesting to note, indeed it is of almost ominous import, to have had revealed that in several essential features of the Ordnance program it will be many, far too many, months, after the declaration of war before we can hope that the production curve will meet the mobilization curve; also it is probably needless to say that a far more serious situation confronts us with regard to the production of aircraft and their accessories. Indeed, the cold fact is revealed that it may happen that it will be many months after the declaration of hostilities before we may reasonably hope to cope successfully with a more enterprising or provident foe.

Present Status

The above outlines briefly the progress made to date, and indicates the status of the work. In brief, we have prepared the plans for the organization in the War Department necessary in event of a major emergency, we have practically completed the calculation of the requirements for such an emergency in terms of finished articles; we have laid down the general plans for the decentralized operation of procurement outside of Washington. I feel confident that all the steps taken have been based upon very careful study of our operations during the war and are thoroughly sound in principle.

I do not want to give you the impression that this work has been completed. There is still a great volume of detail planning to be performed. The calculation of requirements is not yet complete nor have these requirements been translated into terms of material and labor required. The finished plan will not only be reduced to these terms but the requirements for them will be distributed geographically through the logical industrial districts and a very full study made of each one of these local situations, in order to avoid the congestion in labor, power, transportation, housing, etc., that existed in several areas in the last war.

I have been led to the conclusion that the real value of such a plan lies in its ability to arouse and maintain interest in it, and its problems, in the minds of the personnel, both military and civilian, now charged with its preparation, and in the event of an emergency to be charged with its execution. This plan, when completed, will fail of its purpose if it is locked up in a safe and dismissed from our consideration as an accomplished fact. It must be made a living thing of vital interest to many trained minds, growing and changing from year to year as it develops.

This plan will lead inevitably to one conclusion that I must bring to your attention now. It will point out inexorably our shortcomings in certain finished *matériel* and strategic raw materials. It will show that unless we actually construct in time of peace sufficient reserves of certain vital equipment and accumulate working reserves of strategic raw materials that we cannot produce within the continental United States, we would not be able to hold our lines during the early period of the war.

As a nation we are apparently content to assume that we shall keep control of the sea to the extent necessary to import these strategic raw materials. A plan for national defense prepared on such assumption is unsound, unless in time of peace the Navy is maintained on a basis that will enable it to keep control of the sea and so justify this assumption. In the accumulation through a period of peace of the vital equipment of munitions, we accomplish a second purpose, equally important, possibly more important in that we keep alive the art of manufacture of war munitions, which, once permitted to atrophy, cannot be revived easily or quickly.

Our Main Deficiency—Aircraft

Our most notable deficiency at the present time is in the matter of aircraft. The situation in the Army Air Service is most critical. Up to the present time this Service has been using very largely equipment produced during the war. This supply is now practically exhausted. What there is left of it is rapidly disappearing due to deterioration and to the inevitable losses while in actual use.

The amounts appropriated for the purchase of new aircraft are insufficient to provide what is necessary for even the normal peace-time equipment of the present small Air Service organization. The aeronautical industry in the United States, built up to large proportions during the war, has shrunken rapidly and is now practically facing extinction. Until commercial aerial transportation becomes a fact, the only demand for such equipment originates with the military branches of the government. Unless the Government places with aircraft manufacturers sufficient orders to enable them to continue in operation, the industry as such will disappear.

"If war were declared to-morrow what would we do for aircraft?"

The Army Air Service is faced with this condition of affairs: *Its war-time manufactured equipment has been practically used up. The amounts of money appropriated for new aircraft are so small that within two years it will have on hand less than one-half the number of aircraft necessary for its normal peace-time work. There will be no aircraft to equip and expand the Air Service in time of emergency, no reserve on hand, and it will be impossible in less than a year to expand the remnant of the aircraft industry which may be left or to create it anew so that this material can be manufactured in sufficient quantity for use in such an emergency. This situation is not only serious, but is actually alarming. As an economic measure and likewise in the interest of national preparedness, the aeronautical industry in this country should be maintained in such condition that it can supply our peace-time needs and be prepared to expand adequately to meet a war-time demand.*

The Army Air Service should be large enough and adequately equipped so that it would be prepared instantly to meet any air force which an enemy might bring against us. The importance of the role which the Air Service will play in national defense should be thoroughly understood and this component of the Army should be increased to its proper strength. The Air Service should then have a definite procurement program which would insure its proper equipment, replacements, and a reserve supply of aircraft for use in an emergency, and until war-time requirements could be met by increased production. Such a program would call for an average expenditure of approximately $15,000,000 per year for the next five years. Thereafter this annual expenditure could no doubt be decreased. In addition to this expenditure for new aircraft there will be required approximately $10,000,000 for operating the Service.

While the sums just named are large, they are not incommensurate with the actual benefits which would follow their expenditure. It is strongly urged that the War Department and Congress should give serious consideration to this matter and that this necessary expenditure be authorized. It is necessary if we are to be properly prepared to meet a war-time emergency and at the same time it is of economic importance in order that the aircraft industry in this country may be kept alive, ready to respond not alone to a war-time demand, but to the demand for aircraft for commercial purposes which will inevitably eventuate within the next few years.

A Continuing National Defense Program

Over and above the results that it is hoped may be accomplished in carrying out the wise provisions of the Defense Act, which I have thus briefly sketched to you, I have come to realize that this work will contribute materially to an adequate national defense in another way. From these plans and from the data accumulated for them we shall be able to prove beyond a doubt the need for a carefully drawn legislative program to provide in time of peace the appropriations necessary for the accumulation in adequate volume of munitions of war and strategic raw materials. Without them the outbreak of a major emergency would find us not only unprepared but unable to prepare.

It is, of course, farthest from my intention or desire to appear pessimistic, but what I really mean to say is that, in default of adequate provision having been made for the necessary elements above referred to—that is, without having the necessary airplanes and reserves of certain strategic materials, such as nitrates, tin, certain metal alloys and medicines, and the like—we shall never be really prepared successfully to meet the task imposed upon us by a great war.

The National Defense Act, as amended to date, is the clearest and most definite statement of a military policy which this country has ever had. Section 5a, which assigns certain duties to the Assistant Secretary of War, is the first official recognition which has been given to the fact that military plans must remain incomplete and inadequate unless proper consideration is given to the industrial questions involved in the production of military supplies. It is evident that the military plans prepared by the General Staff, and the industrial plans prepared in my office must be closely coordinated and harmonized.

Advisory Board for Seaplane Routes

A plan for developing air transportation routes along the waterways and the coast of the United States was announced at the headquarters of the National Aeronautic Association March 11 by C. F. Redden, president of the Aeromarine Airways. The plan provides initially for the formation of an advisory board of industrial and financial leaders who are interested in placing America abreast of the important commercial air developments in Europe.

The board is composed of thirty-five members, among whom are Rear Admiral W. F. Fullam, U. S. Navy, retired; Col. Sidney D. Waldon, formerly president of the Detroit Aviation Society; Col. J. G. Vincent, vice president of the Packard Motor Car Co. and designer of the Liberty motor; Col. H. E. Emmons, president Detroit Board of Commerce; Allan Jackson, fifth vice president, Standard Oil Co. of Indiana; John D. Larkin, Jr., vice president Larkin Co. of Buffalo; R. C. Hyatt, vice president Union Trust Co., Cleveland; W. E. Scripps, vice president Detroit News; E. C. Romfh, president First National Bank, Miami; E. G. Sewell, president Miami Chamber of Commerce; Prof. E. P. Warner, Massachusetts Insitute of Technology; C. J. Tilden, chairman, Division of Engineering, Yale University; C. F. Marvin, chief of Weather Bureau; Gordon Lee, formerly chief of the Automotive Division, Department of Commerce; Gen. Alberto Herrera, chief of staff of the Cuban army, and Col H. W. Alden, chairman of the Board, Timken-Detroit Axle Co.

Discussing the importance of this advisory committee and the influence it will have on national commercial advancement, Mr. Redden said among others:

"I believe that aeronautical development has now reached a point where it is entitled to substantial public support when conducted under proper auspices, and we have asked this committee to cooperate with us in our efforts to put the cause of commercial aviation on a permanent basis.

"There is no doubt whatever in the minds of government officials in Washington as to the absolute necessity for aeronautic development in peace time so the nation will be effective in times of war. Notwithstanding this conviction, however, outside of the Government only meager effort and wholly inadequate funds have emerged to build up and develop this most important air industry. It is the only channel through which we can hope to develop and maintain a powerful reserve for military or naval aeronautics ready and competent for any service when war comes."

Italian Air Force Created

The reorganization of Italy's air power which Premier Mussolini is pushing with much energy made another step on March 10 with the creation of a new military body, the Regia Aeronautica (Royal Aeronautics), which will include the former army and navy air services and an independent air fleet yet to be created. The new air force will have a status equal with those of the army and navy, constituting the third service of national defense.

The Regia Aeronautica will be headed by Colonel Moizo, one of the earliest Italian army fliers and a member of the Italian delegation to the Washington arms conference, who will be promoted to the rank of general. In his new capacity he will participate in the meetings of the Superior Council of Aeronautics which will be in supreme charge of all aeronautical questions affecting national defense.

"If war were declared to-morrow what would we do for aircraft?"

President Harding Commends Aeronautic Executives

THE WHITE HOUSE

Washington

February 28, 1923.

My dear Mr. Blythe:

It is a pleasure to make acknowledgment of the fine contribution which the Aeronautic Executives Assn. has made in behalf of aeronautics in this country. It is, I must confess, a little hard for me to believe that there should still be at this late date occasion for special efforts at arousing and maintaining public interest in this new mode of transportation and of national defense. To me, the suggestion of making a special effort to sustain interest in aeronautics seems a good deal like going back eight or nine decades and defending the introduction of the steam railroad. It seems just as apparent that the navigation of the air is bound to be one of the most important modes of transportation, as it is that the navigation of the iron highways has already become such a facility. Rapid, sure and economical transportation comes very near to being the very corner stone of our modern civilization. Certainly we cannot doubt that the highroads of the air are destined to be among the most used and useful means of transportation. Every contribution to the development of this new art must, therefore, be a contribution to the growth of better civilization.

Most sincerely yours,
(Sgd) WARREN G. HARDING

Mr. R. R. Blythe,
49 Wall Street,
New York City.

The personal interest President Harding takes in aeronautics is once more shown in the letter, above reproduced, which he recently addressed to R. R. Blythe, organizer of the Aeronautic Executives Association. This association, through the medium of monthly luncheons at which current aeronautical topics are discussed by authoritative speakers, furnishes executives of aeronautical firms with an interesting and informal meeting ground, which is particularly appreciated in the absence of an aero club.

Following are some of the high lights developed in the course of these luncheons:

"The future of aviation has today greater possibilities than the railroad had twenty years ago." (Col. Charles De Lano Hine, recently assistant to the president of the Erie Railroad.)

"A commercial aircraft company must have capital enough to equip its fields and planes, maintain its personnel and operate on a schedule basis long enough to encourage confidence. I prefer express carrying rather than passenger service, as a start ...." (R. E. M. Cowie, vice-president of the American Express Co.)

"A commercial aircraft company can operate on the air mail routes and make it pay. The possible earnings of the Air Mail show a profit." (J. E. Whitbeck, superintendent of the eastern division, Air Mail Service.)

"We are on the verge of a very great development in aeronautics, but this must come from within the industry. Mail contracts will be a big step forward." (Maj. F. La Guardia, ex-president of the Board of Aldermen of New York.)

"We must wipe out these aerial confidence men if we want to retain the confidence of the public." (H. J. Kenner, Director, National Vigilance Committee.)

Airport at St. Joseph, Mo.

The Chamber of Commerce of St. Joseph, Mo., advises that this city now has a municipal landing field which will be dedicated and opened on or about May 1.

The field will be equipped to furnish airmen with oil and gasoline and mechanical services.

Civil Aviation in Australia

Australia has shown considerable enterprise in the encouragement of aerial routes. For the first established of these, conducted by the Western Australian Airways, Ltd., is claimed the distinction of being the most efficient air line in the world.

In regular operation since April, 1922, the service to the end of the year was maintained with 97 per cent regularity along the 1,195 mile route from Geraldton to Derby. During that period, 86,000 miles were flown and 70,000 letters were carried, while valuable freight averaged 600 lb. per month. Much of this was from the pearl fisheries of the north-western coast. The growing popularity of this regular and speedy service is evidenced by the fact that the 4,000 letters carried in April had increased to 12,000 in November. As to the saving in time, it need only be mentioned that the eleven days occupied in the trip by coastal steamer from Perth to Broome is reduced to two days if the air line is used from Geraldton. The value of the service is so appreciated that local interests are pressing for the route to be extended a further 300 miles to Wyndham.

Amundsen's Polar Flight

Capt. Roald Amundsen, head of the Arctic exploration expedition that left Seattle June 3, 1922, in the schooner Maud, will hop off June 21 from Wainwright, Alaska, for his airplane flight over the North Pole, according to a letter received from him by Capt. John Backland, owner and master of the schooner M. S. Holmes. The letter gave the present position of the Maud at 200 miles north by northeast from Wrangell Island and drifting slowly with the ice toward the Pole.

Captain Amundsen intends using for the trans-polar flight a Junkers metal monoplane fitted with a 185 hp. B.M.W. engine. He has also with him a specially equipped Curtiss "Oriole" biplane fitted with a Curtiss C6 160 hp. engine and a Reed metal propeller, which is to be used for reconnoitering in advance of the base ship.

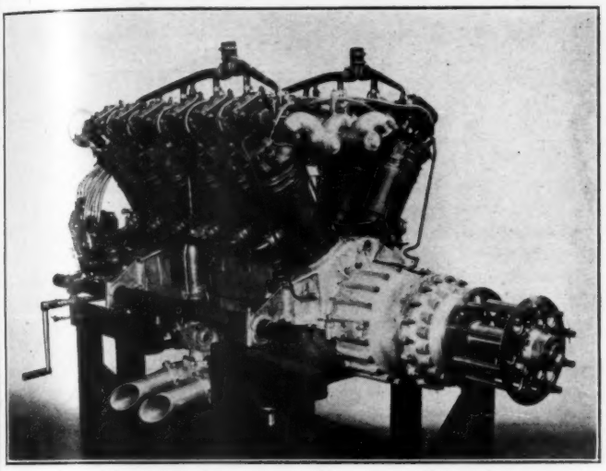
"If war were declared to-morrow what would we do for aircraft?"

Rolls-Royce "Eagle IX" Aero Engine

The Latest Model of a Famous War Engine

The Rolls-Royce "Eagle" engine was originally produced for fighting purposes early in the War, and has probably a longer record of continuous development and useful service than any other aero engine. The first Eagle engine was produced in 1915, and the Rolls-Royce policy of persistent attention to detail and continuous development has been consistently applied. It has always been the policy of the designers to place reliability first, as in their opinion it is the most essential feature in aviation.

After a considerable amount of practical experience in the air, followed by much experimenting and testing, a new and greatly improved "Eagle" engine has been developed and put into production. The new model, known as the "Eagle" IX, has been designed to be equally suitable for both peace and war, and among others has the following advantages over the out-of-date "Eagle" VIII:—



The Rolls-Royce "Eagle IX" engine

In order to obtain simplicity and other advantages, two carburetors are fitted (in place of four). These carburetors are low down on the center line of the crankcase. The substitution of two carburetors in place of four considerably facilitates engine tuning and is an improvement, combined with the new induction system, for the mixture to the various cylinders. In order to permit gravity feed to be used in as many cases as possible, the float feeds have been redesigned, and the engines will now function satisfactorily with a head of fuel only 8 in. above the center line of the crankshaft, which is a great advantage in the design of the complete airplane. The danger of fire has been considerably reduced by certain alterations in the design of the carburetors.

Other alterations in design have resulted in particularly smooth running of the engine without rough spots, and it is easy to maintain the running of the engine in this condition. The design has been modified in details, in order to provide increased strength or wearing qualities wherever experience has shown that the improvements could be effected.

In the rear view can be seen the lay shaft, to which all the controls are led, thus making the installation and changing of engines a simple matter. The hand turning gear can also be seen. The handle is easily changed over to whichever side of the engine is most accessible and if desired chain wheels may be used to bring the handle shaft down to any position required. The ignition is shown with the magnetos completely screened, and with metallic armored ignition wires, as supplied when it is desired to use the engine in a machine fitted with wireless gear.

The rubber connections in the gasoline feed have been entirely done away with, and the amount of piping reduced to a minimum.

The principal characteristics of the Rolls-Royce "Eagle IX" engine are as follows:

CHARACTERISTICS OF THE ROLLS-ROYCE "EAGLE IX"

No. of cylinders, 12.
Type, Vee.
Bore, 4½ in.
Stroke, 6½ in.
Normal crankshaft speed, 1800 r.p.m.
Max. crankshaft speed, 2000 r.p.m.
Normal propeller speed, 1080 r.p.m.
Normal brake horsepower, 360.
Weight dry, without hand starter, propeller boss, exhaust boxes and engine feet, 900 lb.
Gasoline consumption, 25 gal. per hr.
Oil consumption, 1 gal. per hr.

Entries for Schneider Cup Race

The three American entries in the forthcoming Schneider Cup race which the National Aeronautic Association made in behalf of the Navy Department will probably all be float planes.

According to present plans the Navy-Wright, remodelled into a seaplane will be one of the entries, and it is hoped that the two Navy-Curtiss racers may also be converted into seaplanes and entered in the speed event.

Of six machines entered by France for the Schneider seaplane race two have been entered by Société Industrielle de Caudebec-en-Caux (Latham & Co.), two by Société Aéronautique Blanchard and two by Chantiers Aéro-Maritimes de la Seine. The managing director of the latter firm is Lawrence Santoni, and the chief engineer M. Conflenti, both of whom were previously with the Italian Savoia company. As each nation is only entitled to send three representatives, presumably eliminating trials will have to be flown by the French entries.

As three British entries have also been announced, and the entry of three Italian machines is likely, the Schneider Race this year should be worth watching.

Condensed Exhaust Gases as Ballast

An unique method of obtaining airship ballast to make up for the weight of the gasoline burned in flight is being developed by the Bureau of Standards in cooperation with the Army Air Service. It consists of condensing from the exhaust a part of the water formed by the burning of the compounds of hydrogen and carbon of which gasoline is composed. The hydrogen in burning takes from the air eight times its weight of oxygen, so that the resulting water is sufficient in weight to compensate for the gasoline burned.

An airship in flight must be kept in approximately equilibrium so that it has no tendency to rise or to fall. Its weight is reduced by the amount of gasoline burned, and under present conditions this must be compensated for by releasing some of the lifting gas (hydrogen or helium). The new method obviates this waste of gas by keeping the weight of the airship approximately constant.

The exhaust is passed through long light pipes hung from the frame of the airship. In these it is cooled down nearly to the temperature of the air before it is released. The water it contains is condensed and is carried to the ballast tanks, while the other components are released.

"If war were declared to-morrow what would we do for aircraft?"

German-Russian Air Plans

The aviation correspondent of the London *Daily Telegraph* writes: "Ostensibly Russian, but designed, built and operated by German designers, constructors and pilots, a great fleet of 5000 airplanes is now to be equipped and flown within Russian territory.

With the assistance of German aeronautical experts the Soviet government has just completed a survey of the aerial possibilities of Russia, and a new exploitation of these vast territories, initiated and maintained by air, is what is aimed at now. Great trunk air lines have been mapped out by the German experts, and a technical expert in the official air organ of the Soviet authorities now declares that the Russian airway potentialities are becoming so vast that, by 1926, the great air factories which are now being established here and there in Russian territory will be called upon to turn out several thousands of new commercial airplanes each year in order to cope with the ever-increasing demand for "flying stock."

"This air restoration of Russia, providing a swift, constant communication, will, their German advisers have told the Soviet government, effect bigger practical results in a few months than could be achieved by other means in years. From the astute German point of view the scheme will provide a unique method for German engineers not only to gain just the experience which is now required in widespread airway cooperation, but also in detailed "air express" construction and in actual day-and-night pilotage on long routes—because, though the scheme embraces the gradual training of air pilots of Russian nationality, it is taken for granted that in the early stages, and for some time afterward, the bulk of the expert fliers will be German ex-war pilots."

The *Echo de Paris*, on the other hand, announces that the first class of breveted air pilots recently graduated from the big Soviet flying school at Iegorievsk, which is run by German instructors. This class comprised thirty-three Communists, including a woman.

Considerable activity reigns in the Russian aviation world, according to this newspaper. One thousand workmen are working in the Dux airplane factory, near Moscow, which was in pre-Bolshevik days one of the principal Russian aircraft plants. Experiments are under way with large transport airplanes which would carry ten fully equipped infantrymen. The Soviet air force took a prominent part in the recent army maneuvers near Moscow, some of the flights being made in snow storms.

Round the World Flights

It begins to look as if there is going to be considerable competition for the honor of being the first to circle the globe by air during the present year. Sir Keith Smith, who with his brother, the late Sir Ross Smith, was to have made the attempt last year but for the very regrettable accident which resulted in the death of Sir Ross and Lieutenant Bennett, has just returned to England after an eight month's tour around the world, during which he inspected most portions of the route he intends to follow in his attempt this year. Sir Keith will use a Vickers "Viking" amphibian with Napier "Lion" engine, being still convinced that this is the ideal type of machine for the flight. The route to be followed by Sir Keith and his assistants will be approximately the same as that planned for last year's attempt, and it is hoped that a start will be made toward the end of April.

Alan Cobham, the well-known deHaviland pilot, intends to make an attempt on the DH9 with 230 hp. Siddeley "Puma" engine. This type of machine has already, piloted by Cobham, some remarkable flights to its credit, such as a tour of Europe, a flight from London to Casablanca and back to Venice, and a number of others. For the flight around the world, which Cobham, intends to commence sometime in March, floats will be dispatched to Shanghai, Vancouver and Toronto. Naturally some of the stages will be very difficult, such as the long over-sea passages from Japan to Canada and from Canada or Newfoundland to Europe. Cobham will, however, probably take the southern route over the Atlantic, via the Azores. He is hoping to make the trip in a little over two months.

Then, there is the proposed attempt by Messrs, Macintosh, Tymms and McCloughry, who will use a Fairey twin-float seaplane with Rolls-Royce "Condor" 600 hp. engine. The date of the start of this team has not yet been announced, but it will probably be approximately at the same time as the start of the other two.

A round-the-world flying expedition is being organized by *L'Aéro-Sports*, the French aeronautical journal, under the patronage of the French Under-Secretariat of Aeronautics. The expedition will include five pilots, namely Marcel Bapt, a pre-war and war pilot, who will be the leader; the pilots Georges Madon, Lhomme, Picard and Asseville, and five mechanics, Chatelain, sr., Chatelain, jr., Graillot, Laporte and Maillard. The flying *matériel* will include three Gourdou-Leseurre pursuit airplanes and two Caudron C61 three-engined commercial airplanes. A Caudron C59 single-seater sport airplane will be carried along in reserve. All these machines are fitted with 180 hp. Hispano-Suiza engines, which will simplify the problem of spare parts.

The itinerary of the expedition is tentatively planned as follows: France, Italy, Algeria, Tunis, Triplos, Egypt, Syria, Mesopotamia, Persia, India, Siam, Indochina, China, Corea, Japan, North America (by way of the Aleutian Islands and Alaska), Central America, South America (Argentine, Chili), Africa, Spain, France. The length of this world tour would be over 40,000 miles.

The expedition will travel in short journeys of from 200 to 300 miles. Exhibition and demonstration flights will be given at each point of call, the purpose of the expedition being to familiarize the world with the capabilities of French aircraft and pilots.

The start of the expedition was scheduled from Villacoublay, near Paris, on March 15, 1923. F. de Senechal, director of *L'Aéro-Sports*, will precede the expedition to make preliminary arrangements at the various points of call.

Aluminum Alloy Products

In connection with the article "The Design of Metal Airplanes" AVIATION, Feb. 19, 1923, Snead & Co., of Jersey City, N. J., wish to point out that they are employing an electrical method of heat treatment for tubes which is very ingenious. The process beside heat treating also tends to straighten out any curvature which may exist, and by their system of quenching they prevent undue deformation of the tube wall.

Their method produces physical qualities which are much higher than those to be expected from ordinary methods of heat treatment. Scaling, in particular, is practically eliminated. It is true that a short length of waste material is created at the ends of the tube, but it is necessary to cut this off only when it is required to have the full strength right to the end of the tube. They have developed for this in certain cases a hot contact jaw which eliminates this waste. Ordinarily, however, the tubes should not be heat treated in their finished lengths.

Col. Guidoni Returns to Italy

Col. Alessandro Guidoni, Italian air attache in Washington, D. C., has been ordered back to Italy, where he will take charge of the Technical Division of the Italian Independent Air Force which is in course of organization.

Colonel Guidoni exceedingly regrets to have to leave the United States where he was, in his own words, "received most cordially and where he found a limitless field of study in connection with his engineering profession." The numerous friends Colonel Guidoni acquired during his sojourn in the United States will share his regrets at his departure, while wishing him godspeed to his new and important post.

"If war were declared to-morrow what would we do for aircraft?"

ARMY AND NAVY AIR NEWS

Air Service

Porto Rican Fliers Reach Santo Domingo—The Porto Rican Flying Expedition of the Air Service, consisting of six DH4B airplanes under the command of Capt. Thomas G. Lanphier, A.S, successfully finished its flight to Porto Rico on March 19.

On March 13 the six ships flew from Havana to Camaguey, Cuba, and from there to Guantanamo, Cuba, a total distance of 625 miles, all of which were over land. On March 15 a more difficult performance was successfully accomplished when the Porto Rican fliers flew from Guantanamo to Port-au-Prince, Haiti, a distance of 225 miles, which involved crossing the Windward Passage, a 50-mile trip over the sea. On March 17 the six fliers pushed on to Santo Domingo, Dominican Republic, an overland flight of 150 miles over a lake region, which was also successfully negotiated. The squadron was escorted on the route by three Marine Corps fliers.

On March 19 the expedition flew from Santo Domingo City to San Juan, P. R., successfully completing its 3250 mile flight from San Antonio, Tex., in 16 hr. flying time.

The return journey will be over the same route as far as Arcadia, Fla., thence to Jacksonville, Fla., to Fort Bragg, Fayetteville, N. C., to Bolling Field, Anacostia, D. C., from which place, after proper disposition has been made of the airplanes, the officers making the flight will return to their proper stations.

* * *

General Mitchell Tests New Pursuit Ships—Brig. Gen. William Mitchell, Assistant Chief of Air Service, tested three new pursuit airplanes on March 15 at Mitchel Field.

Among the machines flown was the new Curtiss pursuit ship, a biplane of 32 ft. span and 2760 lb. gross weight which is fitted with a Curtiss D12 engine. This machine is entirely built of duralumin and has wing radiators. Lieut. E. H. Barksdale, A.S., flew the ship over a 1-kilometer course at an average speed of 171.7 m.p.h.

Another pursuit ship tried out was the Dornier-Wright, an all-metal monoplane, equipped with a Wright 8-cylinder 340 hp. engine. The plane was constructed in Switzerland by the Dornier Airplane Co., a German concern.

On landing this ship, General Mitchell set her down rather hard with the result that the cantilever struts of the landing gear gave way and the machine came to a rest on the fuselage. The General received a shaking up, but he was not injured in any way.

The third machine tested was the new Curtiss TS navy plane, with a 9-cylinder 200 hp. Lawrance engine, capable of a speed of 135 m.p.h. Lieut. Clayton Bissell, aide to General Mitchell, flew this plane in a mimic combat in the air with the new Curtiss pursuit plane, piloted by Lieutenant Barksdale.

* * *

8,056 Officers in A.S.O.R.C.—The total number of officers in the Air Service Officers' Reserve Corps, as of Dec. 31, 1922, was 8,056. Over half of this number held the grade of second lieutenant. Of the total aggregate strength there are 2,499 non-fliers from the rank of colonel down.

The following shows the strength of the Air Service Reserve Corps in the various grades;

Colonel, 10; lieutenant colonel, 17; major, 155; captain, 623; first lieutenant, 1,271; second lieutenant, 5,980.

GAX Climbs 9600 Ft.—Heretofore the GAX type VI, armored triplane, assigned to Kelly Field was wont to rest content with navigating the ozone at an altitude of approximately 500 ft. In fact, this type of ship has never been flown above that altitude at Kelly Field and, with one exception, officers of the field who have piloted the ship were of the opinion that 500 ft. was the maximum altitude possible. That exception was Lieut. Dale V. Gaffney, who had previously made a number of test flights with this ship. He opined that the GAX was capable of doing better than 500 ft. and proceeded to prove it. On Jan. 31 he piloted it to an altitude of 6,000 ft., after 45 min. of flying.

On the following day, with Captain Harvey and two mechanics as passengers, he again took off for an altitude test, leaving the ground at 1.15 p. m. Many of the officers of the field watched the test with intense interest as Lieutenant Gaffney circled the field, climbing higher and higher each large circle made until the giant ship appeared not much unlike some small bird. After 45 minutes of flying, the altitude of 9,600 ft. was reached. The landing was made one hour after the take off.

* * *

Army Orders—First Lieut. Raymond Carl Zettel, Inf. Kelly Field, transferred to Air Service, with same station.

Maj. George E. A. Reinburg, A.S., from Bolling Field to Philippine Dept.

Maj. Byron Q. Jones, A.S., from Philippine Dept. to Office Chief of Air Service.

Resignation of Capt. Alfred Clarence George, A.S., accepted by the President.

First Lieut. Roscoe C. Wriston, A.S., from Fort Bliss, Tex., to Hawaiian Dept.

First Lieut. Leonard D. Weddington, A.S., from Hawaiian Dept. to Fort Bliss, Tex.

Coming Aeronautical Events

AMERICAN

May — *National Balloon Race.*
May 30 — *Fifth Annual Aircraft Exhibition, Flying Club of Baltimore, Logan Field, Dundalk, Md.*
Oct. 1-3 — *National Airplane Races, St. Louis, Mo.*
Late Fall — *Curtiss Marine Flying Trophy Race.*

FOREIGN

May 13 — *Grand Prix (Balloons), Paris, France.*
June 25-30 — *International Aero Congress, London.*
July 20- — *International Aero Exhibition, Gothenburg,*
Aug. 12 *Sweden.*
Aug. 3-31 — *Sailplane Meet, Rhoen, Germany.*
Aug. 5-26 — *Sailplane Meet, Vauville, near Cherbourg, France.*
Sept. 28 — *Schneider Maritime Aviation Trophy Race, Cowes, Isle of Wight, England.*
Dec. 1 — *Entries close for French Engine competition.*

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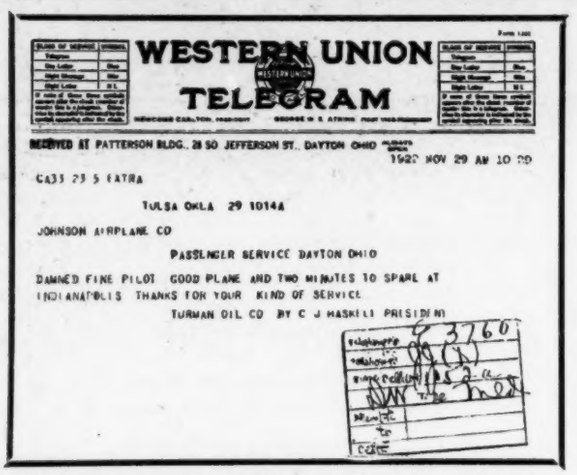

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American	Oak	Toothpick	8'4"	5'2"	15.00
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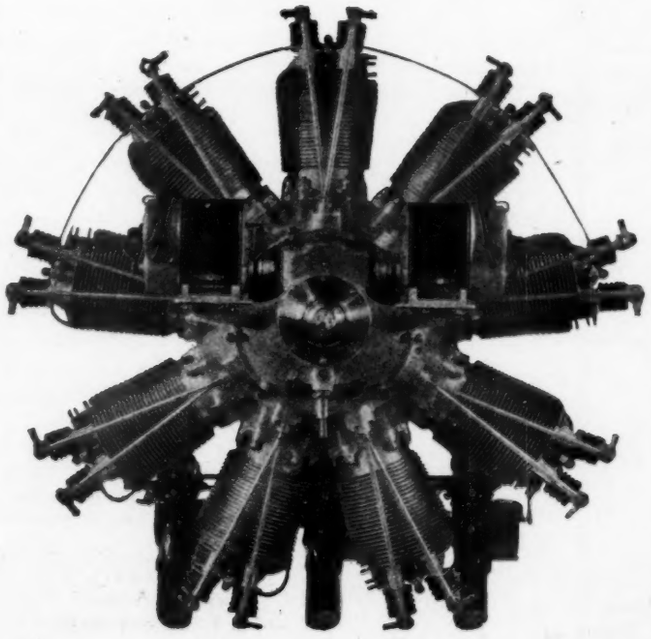

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Distinguished Service Cross Awards—The War Department announces the following awards of the Distinguished Service Cross:

First Lieut. Thomas J. Herbert, of Cleveland, Ohio, for extraordinary heroism in action near Chaulnes, France, Aug. 18, 1918. Another time Lieutenant Herbert was in the U. S. Air Service attached to the 56th Squadron, R.A.F. British. With a formation of six machines he attacked eighteen enemy Fokkers, shooting down one in flames. During the fight he was shot in the leg and his gasoline tank was hit. By skilful maneuvering he regained his lines, becoming unconscious from loss of blood as he landed. On Aug. 4, 1918, at Cappy, France, he destroyed a Pfalz, saving his patrol leader who was at the mercy of the enemy. On Aug. 1, he joined an attack on an airdrome at Epinoy from 200 ft., killing 2 enemy mechanics by machine gun fire. "The bravery, skill and determination of this officer were an inspiration to other members of his squadron" the citation states.

First Lieut. John O. Donaldson, of Washington, D. C., was awarded a Distinguished Service Cross by the Secretary of War recently for devotion to duty and gallantry in face of the enemy while a 2nd lieutenant in the U. S. Air Service attached to the 32nd Squadron, R.A.F. The award was for extraordinary heroism in action while flying near Mont Notre Dame, France, on July 22, 1918, he attacked a formation of 20 Fokkers and shot down one in flames. On Aug. 8, 1918, he engaged five enemy scouts over Sicourt, causing one to crash to the ground. On Sept. 8, 1918, over Sicourt, he engaged one of the three enemy planes, attacking a Bristol plane, and shot it down in flames. On Aug. 25, over Hancourt, he attacked 4 Fokkers, diving into their midst and shot one down, the pilot descending by parachute. On July 25, over Fismes, he drove an enemy plane down out of control. On Aug. 10, over Péronne, he got another; on Aug. 29, over Cambrai another plane was driven down, making a total of seven.

* * *

Airmen Battle for Their Lives in Heavy Sea—Capt. R. J. Kirkpatrick, Lieut. F. A. Johnson and Sergt. Roy Grooms, of the 23rd Aero Squadron, stationed at Luke Field, H. T., had an opportunity to exploit the theories of Jules Verne recently, when for an hour after a forced landing at sea in an HS2L Flying Boat, which had been smashed in by the heavy swell running, they battled with the surf and their rapidly sinking seaplane to keep above water.

Prompt assistance was rendered by the Commanding Officer of the Naval Air Station, and speed boats dispatched to the rescue. They arrived just after the occupants had been taken aboard a large fishing sampan. No injuries were sustained, however, and it was later found that the HS2L would remain afloat, with about 18 in. of the forward hull and half the top wing exposed for six or eight hours.

Naval Aviation

Navy Contract for Observation Planes—The Navy has made a contract with the L.W.F. Engineering Co., of College Point, N. Y., for twenty-six NO observation planes. The planes are planned for three man observation work and will be convertible for use on land or sea. The first of these planes is to be ready within three months, it is said.

* * *

Training for Reserve Naval Fliers—Arrangements whereby college and high school graduates under thirty years of age may receive free training in aviation to qualify as reserve flying ensigns in the United States Naval Reserves are announced by the Police Reserves of New York City, through whose efforts the plans were completed. The aviation division, said Col. John F. Dwyer, aid to Commissioner Rodman Wanamaker, will be instructed by two commissioned officers and four mechanics from the Naval Reserve.

The course will consist of a summer session at Fort Hamilton, where the rudiments and mechanical knowledge will be taught. The second year there will be forty-five days of intensive training at a land station and the third year forty-five days at sea.

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La Technique Aeronautique, (French), 1921, 3 issues; 1922, 11 issues.
Tohtli, (Mexican), 1917, 5 issues; 1918, 12 issues; 1920, 4 issues; 1922, 11 issues.
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Commercial Aviation, (English), 1919, 9 issues.
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Flight, (English), 1917, 42 issues; 1918, 42 issues; 1919, 43 issues; 1920, 47 issues; 1921, 48 issues; 1922, 49 issues.
Aeronautical Jl., (English), 1915, 3 issues; 1916, 5 issues; 1918, 12 issues; 1919, 10 issues; 1920, 6 issues; 1921, 8 issues.
Aircraft, (English), 1919, 12 issues.
Aeronautics, (English), 1917, 48 issues; 1918, 44 issues; 1919, 41 issues; 1920, 35 issues; 1921, 9 issues.
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